

## REMARKS

This is in response to the Office Action dated July 7, 2004. In view of the foregoing amendments and following representations, reconsideration is respectfully requested.

Initially, the specification and abstract have been reviewed and revised to make a number of minor editorial amendments. Due to the nature of the revision involved, a substitute specification and abstract has been prepared. No new matter has been added. Also enclosed is a "marked-up" copy of the original specification and abstract to show the changes that have been incorporated into the substitute specification and abstract. The enclosed copy is entitled "Version with Markings to Show Changes Made."

To further facilitate the Examiner's reconsideration of the application, original claims 1-16 have been canceled and replaced with new claims 17-23. Each of the new claims has been carefully drafted to ensure compliance with the requirements of 35 U.S.C. § 112, second paragraph.

Next, on pages 2-4 of the Office Action, the original claims are rejected as follows:

*Claims 1-4 are rejected under 35 U.S.C. § 102(b) as being anticipated by Song et al. (U.S. Patent Application Publication 2002/004718);*

*Claims 5-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Song; and*

*Claims 11-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Song in view of Kim (US Patent Application Publication 2001/0048113).*

New independent claim 17 is directed to the embodiment illustrated in Fig. 11 and requires, *inter alia*, a plurality of bumps and dips provided in an area corresponding to the second area of the n-type contact layer. Claim 17 also specifies the locations of the top and bottom levels of the bumps and dips relative to the claimed active layer of nitride semiconductor. Support for the new independent claim can be found at least in paragraph [0079] and advantages of the claimed arrangement are described in paragraph [0080]. In particular, the claimed construction can improve the efficiency of outgoing light by 10% to 20%.

A review of the applied prior art references indicates that only **Kim** discloses “dimples” (corresponding to the claimed bumps and dips) formed on an upper contact layer 70 (corresponding to the claimed p-type layer). However, as shown in Fig. 3, the Kim reference clearly does not disclose or suggest bumps and dips on an n-type layer. Apparently, the Kim construction cannot achieve light diffusion emitted from an active (light-emitting) layer in a horizontal direction.

In contrast, in the embodiment of the present invention defined in claim 17, light emitted horizontally from the active layer (6) is reflected or diffused by the side of the bumps (11) formed in the n-type contact layer to a vertical direction, which results in effectively increasing output light. This important advantage is explained in the original disclosure as follows:

“[0051] . . . The projecting columnar bump can allow the light traveling through the n-type contact layer to reflect toward the observation side and to outgo. In addition, the traveling direction of the light emitted from the active layer in the side surface direction is

varied toward the observation side directly by the projecting columnar bump, so that the efficiency of light outgoing toward the observation side is more effective.”

“[0066] . . . Additionally, it is considered that positioning the top of the bumps and dips higher than the position of the active layer in view from the side of the LED (positioning them in the p-side) allows the light from the emitting side surface to directly strike the bumps, so that the light changes its direction toward the observation side.”

Since the Song and Kim references do not include bumps and dips formed in the second area of the n-type contact layer, the references do not meet each and every limitation of claim 17. Furthermore, claim 17 recites the specific locations of the top and bottom levels of the plurality of bumps and dips relative to the active layer.


Accordingly, it is submitted that the collective teachings of the applied references clearly do not disclose or suggest the arrangement required in new independent claim 17. Therefore, claims 17-23 are clearly allowable over the prior art of record.

In view of the above, it is submitted that the present application is now clearly in condition for allowance. The Examiner therefore is requested to pass this case to issue.

In the event that the Examiner has any comments or suggestions of a nature necessary to place this case in condition for allowance, then the Examiner is requested to contact Applicant's undersigned attorney by telephone to promptly resolve any remaining matters.

Respectfully submitted,

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November 8, 2004